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MEMO

TO: Joe Su, MassDEP

FROM: Steve Piper, MJB&A SGP

Cc: Ron Kenny, Tom Keefe, Jim Lally, Chelsea Sandwich

DATE: December 29, 2009

RE: Addendum to Compliance Test Protocol for Chelsea Sandwich Terminal RTO Compliance Test (MBR-08-IND-007)

As a follow up to our December 22 telephone conversation, this memorandum provides responses to your questions regarding the above referenced Compliance Test Protocol submitted as required by MBR-08-IND-007 for Chelsea Sandwich LLC, 11 Broadway, Chelsea, MA. Your questions (as I understood them) are re-stated in italics followed by a response that serves as an addendum to the application.

1) *Provide details of the proposed method for determining the capture efficiency at the truck loading racks.*

The capture system is designed with a 4-inch flex suction hose at each residual loading bay. Details of the design of the capture system have been provided in a memo to Tom Hannah, dated May 22, 2008 (attached). The design engineer has indicated that the system was designed to provide equal flow at each truck rack exhaust. MJB&A had developed the test protocol with that design feature in mind and had planned to measure the total flow in the common header. However, you had indicated a desire to measure the flow rates at each lane to prove the assertion that the flow rates are equal in each exhaust that feeds the capture header.

MJB&A will measure the flow rate at each affected truck loading rack (as designated in the protocol) using EPA Reference Method 2C - *Determination Of Gas Velocity And Volumetric Flow Rate In Small Stacks Or Ducts (Standard Pitot Tube).* The flow rate measurement locations will meet or exceed the criteria delineated in EPA Reference Method 1- *Sample and Velocity Traverses for Stationary Sources.*

The overall header pressure will also be monitored and recorded for future correlation purposes. (The Chelsea Sandwich Terminal desires to develop a SOMP that will consist of monitoring and recording the header pressure on a daily basis and implementing a maintenance program of inspecting the exhaust system for blockages of flow.)

The location of each loading lane flow measurement will be approximately five diameters upstream of the connection point of the flex hose to the 4-inch diameter stainless steel duct. The pitot tube will be inserted through a ¼" opening and traversed across the width of the duct in accordance with EPA Reference Method 2C - *Determination Of Gas Velocity And Volumetric Flow Rate In Small Stacks Or Ducts (Standard Pitot Tube).*

Validation of the 90 percent capture will be primarily by verification of the 300 cfm design criteria (+/- the variability of the method). Additionally, an intrinsically safe hand-held FID (Photovac, or equivalent) will be used to monitor the VOC concentration around the truck hatch opening for a subjective assessment of the capture efficiency.

2) *Provide details of the proposed method for measuring capture efficiency at the Tanks.*

MJB&A is proposing to use a combination of EPA Reference Method 2C - Determination Of Gas Velocity And Volumetric Flow Rate In Small Stacks Or Ducts (Standard Pitot Tube), and a modified Method 21 - *Determination Of Volatile Organic Compound Leaks.*

The location of each individual tank vent flow measurement will be approximately five diameters upstream of the connection point of the capture hood configuration to the 6 or 8-inch diameter stainless steel ducts. The flow rate measurement locations will meet or exceed the criteria delineated in EPA Reference Method 1- *Sample and Velocity Traverses for Stationary Sources.*

The pitot tube will be inserted through a ¼" opening and traversed across the width of the duct in accordance with EPA Reference Method 2C - *Determination Of Gas Velocity And Volumetric Flow Rate In Small Stacks Or Ducts (Standard Pitot Tube).* Validation of the 95 percent capture will be partially by verification of the 560 cfm design criteria (+/- the variability of the method).

In addition to the flow confirmation, MJB&A will use an intrinsically safe hand-held FID (Photovac, or equivalent) to monitor the VOC concentration in two places at each tank's capture hood. The first location to be monitored is the hood fresh air intake. The second location is inside the hood at the throat of the tank vent. Method 21 will be modified in that the results will not be used against a fixed threshold of concentration to determine whether the system leaks. Instead, the capture will be determined by comparing the concentration at the fresh air intake to that of the throat of the tank vent using the following formula:

$$\text{Capture efficiency} = (C_{th} - C_{fa}) / C_{th}$$

Where,

C_{th} = VOC concentration at the Tank Throat, and

C_{fa} = VOC concentration at the fresh air intake.

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MEMO

TO:	**Tom Hannah, MADEP**
FROM:	**Steve Piper, MJB&A**
Cc:	**Ron Kenny, Tom Keefe, Chelsea Sandwich**
DATE:	**May 22, 2008**
RE:	**Chelsea Sandwich Terminal Odor Control Application (No. W213528)**

As a follow up to our May 9 telephone conversation, this memorandum provides responses to your questions regarding the above referenced Non-Major CPA application for Chelsea Sandwich LLC, 11 Broadway, Chelsea, MA. Your questions (as I understood them) are re-stated in italics followed by a response that serves as an addendum to the application.

1) *Provide detail to explain the 90% capture estimated for the truck loading emissions.*

The capture system is designed with a 4-inch flex suction hose at each residual loading bay. After lowering the residual oil top-loading arm into the truck hatch, and prior to commencing loading, the truck operator positions the suction hose over the truck hatch opening. To enhance the capture efficiency, the end of the 4-inch flex hose is fitted with a disk that acts to cover the portion of the truck hatch opening that is not occupied by the top-loading arm. In fact, the plastic disk has a small half-moon cut out that allows a better fit against the loading arm. The reason for a flex hose verses a fixed hose is to allow for adjustment to the differing truck heights. While the capture efficiency is likely well above 90% for the trucks with small hatch openings, some trucks have larger diameter openings which caused the capture design vendor be conservative by assigning the system a 90% capture efficiency rating.

2) *What percentage of trucks have the large hatch opening?*

10 to 20%

3) *What is the exhaust rate of displaced air from the truck hatch during residual oil loading?*

The residual loading pump rate is 500 gal/min. Based on straight volumetric conversion (7.48 cu ft/gal), the air exhaust will be 67 cfm. The capture hoses (4-inch flex hose) for each residual loading bay are set up to exhaust at a rate of 300 cfm based on a capture

hood design objective to pull in at least four times the exhaust rate of the source being captured.

4) *Are the distillate loading lanes set up for top loading or bottom loading?*

The loading rack has 6 distillate loading lanes of which 4 are for top loading and 2 are for bottom loading.

5) *Confirm the RTO data-logging capability for temperature (p.6 of the November 13, 2007 proposal from ACC says "paperless temperature recorder" and the application form BWP AQ SFC-5 says PLC).*

The temperature will be recorded by several thermal couples within the RTO and fed into a Programmable Logic Controller (PLC). The 1,500 F set point for Bed 1 and bed 2 will be measured by thermocouples TE-108 and TE 109. The temperature data will fed to a data logger and will have an alarm for both over-temp conditions and under temp conditions. The PLC records the temperature electronically and stores the data electronically. The historic data will be saved for at least 5 years and can be reviewed at any time from a PC.

6) *What is the protocol for system operations if the temperature drops below the 1,500 F minimum temperature.*

The purpose of the RTO is to control emissions from both residual oil storage tanks and residual oil truck loading. In the unlikely event that the RTO falls below the minimum operating temperature, the system will alarm and maintenance/repair efforts will be put into action immediately. For the period of time the RTO is below temperature, nothing can be done to cease the evaporative emissions associated with the residual oil storage tanks. In the case of truck loading, Chelsea Sandwich could consider limiting the loading, however, many industrial, commercial residual oil customers in the Boston area are dependent on the prompt delivery of heating oil in the cold winter months. Because Chelsea Sandwich is the largest supplier of residual oil in the Boston area, it would not be reasonable to require that truck loading be ceased.

DEP will be notified by phone or fax immediately in the event of an RTO low temperature problem. Chelsea Sandwich will record the duration of the low temperature period in order to accurately account of the quantity of uncontrolled VOC emissions.